boldt and Ritter were given. He reached Koorlyk, a distance of about 180 miles, without difficulty, but had much trouble in going on to Dzoon Zassak. The distance from Saisan to Dzoon Zassak, at the foot of the Burdan Booda range, is 1370 miles. The whole country traversed, with the exception of occasional oases, is a desert, and forests were found only on the Tien-Shan. Topographical, barometrical and meteorological observations have been made, and accurate data obtained for mapping a large extent of country. From Dzoon Zassak he started for Lhassa, and after being once misled succeeded in crossing the Blue river and reaching the Tan-la plateau where a great snowy chain of mountains attains a height of 16,800 feet.

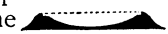
After driving off a party of nomads who attacked them the expedition reached its furthest point at the village of Nabchu, 180 miles from the capital, permission to visit Lhassa being refused by the Thibetan authorities. The return journey to Tsaidam in the midst of the violent winter storms, was very trying, and took two months. Col. Prejevalsky visited Koko-Nor and finally arrived at Si-ning on March 19th. He hopes to explore the upper course of the Yellow river and return home by way of Urga.

MICROSCOPY.[1]

USE OF COLLODION IN CUTTING THIN SECTIONS OF SOFT TISSUES.—The preparation to be cut being embedded as usual, collodion is applied to the surface of the object by means of a fine brush. The collodion is of the regular strength of the United States Pharmacopœia and should be allowed to settle so as to become as clear as water, and the clear portion decanted and reserved for use. Then after the first cut has been made with the microtome, and the superfluous alcohol removed by means of a piece of clean blotting paper free from ravelings, a small drop of collodion should be taken up with the brush and placed in the center of the object so as to allow it to flow out on all sides to prevent the formation of air bubbles. After being allowed to harden a minute, the section may be cut and placed on the slide with the film of collodion underneath. The advantage in the use of the collodion is that preparations which combine hard and soft tissues or those which are loosely connected, are held in place until the section is removed to the slide, stained and securely mounted.—*Norman N. Mason, Providence, R. I.*

THE ATWOOD CELL.—This new device, intended exclusively for mounting opaque objects, was designed by Mr. H. F. Atwood, of Rochester, and is made in hard rubber by Bausch and Lomb of that city. It consists of a black disc, hollowed at the top to contain the object, and furnished with a rim to receive the cover glass. Those now being made are adapted to half inch covers, and cost thirty cents a dozen. They can be obtained from the

[1] This department is edited by Dr. R. H. Ward, Troy, N. Y.

inventor or from the dealers in microscopical supplies. The cut gives a sectional view of this cell, the dotted line  indicating the cover glass and the open space below it the location of the object. The glass cover is easily attached by a little shellac or other suitable cement; and the whole cell may be cemented, if desired, to the center of a common glass slide. For convenience of exchanging by post, or for storing a large number of objects for future reference, in a small space, the glass slide may sometimes be omitted altogether, the name or number indicating the object being merely attached to the back of the cell.

ARTIFICIAL CRYSTALS OF GOLD.—In casting bars of pure gold for the manufacture of foil, traces of crystallization may often be observed upon their upper surfaces, and sometimes distinct crystalline forms. These are generally simple triangular faces slightly raised, very similar in appearance to specimens sometimes found in nature. Occasionally several faces of the octohedron may be seen, the edge in some instances being half an inch in length, and quite sharp and well defined. The purer the gold is, the more likely the crystals are to form, and they are oftenest seen when the bars are cast from that which has been previously crystallized by the battery process described below. * * *

The precipitation of gold from solution by the aid of a battery is a well-known process in the common operation of electro-gilding, but to deposit it in the crystalline form is a process of comparatively recent date, having been patented in 1860 as a method of preparing gold for dental purposes. The process is briefly as follows: A solution of chloride of gold and ammonium is placed in a shallow dish coated with heavy gold foil, which is connected with the zinc plate of a large Daniels' battery. Near the top of the solution and connected with the copper plate of the battery, a roll made up of thin strips of pure gold is suspended, enclosed in a muslin bag. The strength of the battery current is controlled by a coil of wire arranged as a rheostat, a clamp terminating one of the battery wires enabling the operator to include a greater or less number of coils in the circuit. The necessary conditions being fulfilled, on completing the circuit the gold is gradually dissolved from the roll and deposited on the bottom of the dish in bright crystalline flakes having the appearance of feathers or fern leaves when examined under the microscope. * * * I have been quite surprised that no trace of faces is to be observed upon these crystals, as is always the case with natural ones. The latter are seen under a low power to be made up of strings of distorted isometric crystals which are often so distinct that they can be measured. The artificial ones do not show this structure, and when magnified to three hundred diameters only show a slightly beaded look along the side ribs, but nothing that can be considered distinct crystalline forms. With the power

mentioned the whole surface of each crystal is in focus at once, showing that the different sets of ribs are in the same plane. Where one crystal lies upon another, when examined under a power of a hundred and fifty diameters, both are in focus at once, showing that they are exceedingly thin and lie perfectly flat.
* * *

If a film of amalgam is allowed to form on the surface of a piece of pure gold, and the mercury be then driven off by heat, traces of crystallization may sometimes be observed, a network of indistinct crystals remaining. To accomplish this the gold should be perfectly pure, and the heat applied very gently at first. With the greatest pains, however, the result is not always, or even often, satisfactory. The surface is generally left in an amorphous condition, or at best covered with angular depressions. Very rarely, and under conditions not fully understood, the crystallization is distinct enough to be recognized as such. But distinct though minute crystals of gold amalgam may easily be obtained if the mercury is dissolved out with dilute nitric acid instead of being driven off by heat.—*A. H. Chester in Am. Jour. Sci. and Arts.*

Angular Aperture.—Dr. Geo. E. Blackham's paper on this subject, read at the Microscopical Congress at Indianapolis, has been published by the Industrial Publication Company of New York. The paper presents a comprehensive review, in a popular rather than a mathematical style, of the subject of the angular aperture of microscopic objectives. It is neatly published in an attractive form, and extensively illustrated with optical diagrams. and it will be a convenient and welcome addition to the libraries even of those most familiar with the somewhat trite subject.

Sweating of Microscopic Slides. — Not long ago a well-known optician showed to me a spoiled "podura" slide. The scales were very good and large—in fact, it was a slide which I had given to him, and it had been selected by myself in Beck's establishment in London as unexceptionally fine. This slide began slowly to show symptoms of "sweating." One scale after another appeared as though moisture had, in some mysterious way, penetrated to the objects; it was not water, however, for when the cover, after much trouble, had been removed, and warmed sufficiently to evaporate anything like water, the scales still exhibited the same appearance, and, in fact, the heat required to get rid of this apparent moisture was so great that the scales were charred. When wax rings are used, this apparent wetting or "sweating" occurs quickly, and more disagreeable than this, innumerable elongated specks, possibly crystalline, appear all over the under surface of the cover-glass. The same trouble occurs when any of the ordinary asphalt preparations are used, and the only cement which I have thus far found to be tolerably

successful is shellac thoroughly incorporated with the finest carbon (diamond black) such as is used in the preparation of the best printing inks; the solvent being alcohol, these rings dry rapidly, and the cover is attached by heating. Even these rings cannot be trusted unless thoroughly dry, and spontaneous drying is better than baking. I have had preparations spoiled after mounting on asphalt rings which had been made for over a year, and which had been subjected for several hours to the heat of a steam bath. With large, somewhat coarse objects, the defect is not so marked, but with delicate ones, and especially test objects, it is simply a nuisance. With care I think the shellac rings may answer pretty well. I have not tried the aniline colored rings. The moisture (whatever it is) and the crystalline specks appear to be derived from the vaporizable parts of the wax or cement given off under conditions where one would suppose such a thing impossible; it is however a fact; I have the proof of it, and I dare say hundreds of others have, too plainly evident. There is another mode of making cells which promises well for permanence. My attention was first called to this method by Dr. Tulk, of London, who suggested for this purpose the thin gutta-percha tissue used by surgeons in the place of oiled silk. I have had special punches made which cut neat rings from this tissue, and I have used these rings with the greatest satisfaction. I have no preparation of my own more than two years old, these, so far, show no signs of change. Dr. Tulk informs me that he has them ten years old, and still good as when new. I have noticed that in some recent papers in the microscopical journals the writers who, with little experience, have so lauded wax rings, speak of "thin rubber" for rings. Evidently they have seen somewhere the gutta-percha mount, and supposed it rubber—the latter will not answer, melted rubber will not become hard. One beauty of the gutta-percha ring is the very moderate heat required; it is thus available for many objects which might be injured by the greater heat necessary for the asphalt or shellac rings. As these rings, the arrangement of which I have spoken of, can be rapidly made, and as they can be kept for any length of time (shut away from the dust), they are at any moment ready as well as convenient for use. The preparation is first arranged, dried or burnt on the cover, the slide cleaned, a ring laid on the center, and on this the cover is placed; the whole is now held together by the forceps and *slightly* warmed, just sufficient to soften the gutta-percha; the forceps may now be laid aside, or used simply to press the cover home, warming the slide gently, also the cover; the perfect contact of the softened "tissue" with the cover and slide is easily recognized, and with a little care this can be effected very quickly, and nothing further is necessary. A finishing ring of colored cement makes a very neat mount, but it is not necessary.—*Prof. H. L. Smith, in "Science."*